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BULLETIN

OF

The National Association for the Study and Prevention of Tuberculosis

Vol. II. MARCH, 1916. No. 6.

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"The Invisible Enemy." A New Motion Picture

A real contribution to the educational campaign against tuberculosis is the motion picture entitled "The Invisible Enemy" which has just been released. The picture, which is in five reels, is a powerful and dramatic presentation of the essential facts with reference to tuberculosis including contact infection, the danger of bad housing, the viciousness of quack methods, and, in contrast, the value of sound sanitation and other ways of combating the disease.

This film was originally produced by a company in Los Angeles as an independent venture and was called "For the Good o' Humanity." In its original form it was not usuable at all in the anti-tuberculosis campaign, but through the co-operation of the National Association the picture has been completely retitled and rearranged so that at present it is highly commendable.

The picture will be booked exclusively by the E. K. O. Film Co., 729 Seventh Ave., New York City. It will be used in the theatres on a royalty or commission basis. It is planned first of all to use the picture in the theatres, but anti-tuberculosis associations may rent it if they wish.

A brief synopsis of the picture follows:

Governor Webster is an intimate friend and business associate of Haggerty, a greedy capitalist, who owns a row of filthy ramshackle tenements. His long-cherished plan is to see his daughter, Muriel, wedded to Haggerty. One of Haggerty's tenants is the widowed Mrs. Duryea with her two daughters, Faith, the older, toiling in a laundry, and Hope, a mere child, selling newspapers on the street.

The mother is in the last stages of tuberculosis, a victim of the unscrupulous Dr. Quack, who gets the greater part of the family's scant income for a patent medicine which contains little else than poison. While the girls are out working she is overcome by hemorrhage and, remembering the few dollars set aside by Faith for her little sister's vacation, she breaks open the savings-box and drags herself to Dr. Quack's office in search of relief. Quack has a lucrative business built upon the ignorance of the poor, and does not hesitate to give the emaciated Mrs. Duryea in exchange for her last money another bottle of his "cure," which she eagerly takes after returning home. This dose proves fatal.

Charity, the untiring social worker, is called in by frightened neighbors and soon discovers the bottle which contained Dr. Quack's medicine. She reports to the Health Department, an analysis is made, and with this evidence against him Dr. Quack is arrested.

When the two girls arrive at their mother's bedside Faith summons Dr. De La Roche, whose name she has noticed in a newspaper report of a banquet tendered to him the night before by his colleagues upon his return from Europe where he has devoted himself to research work in tuberculosis. The physician, who is suffering from overwork and strain, hastens to the tenement lodging in a pelting rainstorm, but arrives too late. Mrs. Duryea is dead. He realizes more than ever that to root up the Invisible Enemy of mankind, tuberculosis, fresh air, sunshine, and wholesome living conditions are needed. As the result of the exposure incident to this call he breaks down in health and goes away to visit a friend at the Carlos Ranch.

Hope, undernourished and weak, soon begins to show alarming signs of tuberculosis contracted from her consumptive mother. While suffering an attack on the street corner she is picked up by Jack, son of Governor Webster. He carries her in his automobile to her dismal room, where she expires in the arms of her sister.

Faith is now left alone in the world. She is unable to pay the rent and is obliged to accept Jack Webster's help. Jack falls in love with Faith, marries her, and takes her to his father's home. But neither the Governor nor his haughty daughter, Muriel, is willing to accept Jack with his bride of the slums, and the unhappy couple are compelled to leave the Governor's home to fight their own way.

After a severe struggle Jack and Faith find shelter and work on the Carlos Ranch, where they meet Dr. De La Roche, who has regained his impaired health through the invigorating outdoor life, good food, and rest. Carlos becomes much interested in the physician's experiments and both decide to fit up a suitable laboratory at the ranch. De La Roche goes to the city for the equipment, and while there secures the support of Governor Webster for the anti-tuberculosis and housing movements. Muriel herself becomes greatly interested in Dr. De La Roche's work on behalf of the consumptive poor and also becomes reconciled to her brother and his bride. Her increasing interest in Dr. De La Roche's studies grows into admiration and love for the unselfish friend of humanity, so that she decides finally to break her engagement with Haggerty. On the very day when he receives the returned engagement-ring the news that his entire fortune was wiped out in stock speculation, reaches him. In despair he commits suicide.

Governor Webster, induced by Muriel to come to the Carlos Ranch, forgives his son and accepts his bride, while Muriel, who is anxious to become an active worker against the white plague, marries Dr. De La Roche to share with him in the fight against the Invisible Enemy, tuberculosis.

In the last reel of the picture the operation of the California Anti-Tuberculosis Association in the Red Cross Seal campaign and also of the local tuberculosis clinic and the Barlow Sanatorium in Los Angeles are shown.

Why Sign a Transportation Agreement?

Within a few days every secretary of an anti-tuberculosis association in the United States should receive a letter from the Committee on Transportation of the National Conference of Charities and Correction with reference to signing the Transportation Agreement to prevent "passing on" of indigent consumptives. It is hoped that no association in the country will take a narrow view of the matter and refuse to sign the agreement.

The problem of the indigent consumptive is one which should be the concern of every anti-tuberculosis society. It is the duty of these associations to protect the tuberculosis victim from those who would lure or send him away from home when he had better not go.

Anti-tuberculosis associations can help to solve the problem of the migratory indigent consumptive by signing the transportation agreement. They can help further by getting other organizations in their respective territory to do the same thing. Hundreds and possibly thousands of victims of well-meant kindness are sent West every year by churches, lodges, labor-unions, groups of workers in shops and stores, overseers of the poor, and many others. The notion that climate is indispensable to cure in tuberculosis is still all too prevalent in such circles as these. Anti-tuberculosis associations can do three things by educating such groups to sign the Transportation Agreement. They can, first of all, save the individual consumptive from the misery incident to his going away from home without enough money; secondly, they can save the communities of climatic districts a great burden of expense in caring for these victims; and thirdly, they can help the anti-tuberculosis campaign at home by showing such well-meaning groups as are above mentioned that tuberculosis can be cured in their own locality and that local facilities are the first necessity.

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HAVE YOU REPORTED?

Those who have not made complete returns for the Red Cross Seal Sale of 1915 either to their state agents or to the National Association (if they are general agents) should do so at once. Delays in reporting are serious handicaps in the anti-tuberculosis campaign. Settle up your account today.

Winners of the Red Cross Seal Pennants in the intercity and the interstate competitions will be announced in the April number of the *Journal of the Outdoor Life*, by Press Bulletins released early in April, in the April BULLETIN and the *Red Cross Magazine*.

DANISH-SWEDISH TRANSLATION OF KNOPF'S ESSAY

Anti-tuberculosis workers and physicians who are dealing with Scandinavian peoples will find a new Danish-Swedish translation of Dr. S. A. Knopf's Prize Essay very helpful. The translation has been made by Dr. A. C. Amundsen, of Cambridge, Wis. He has no desire to make a profit from the sale of the book and will sell it to anti-tuberculosis associations for cost price, seven cents per copy, exclusive of transportation. Orders should be sent directly to Dr. Amundsen.

A CORRECTION

Through a careless oversight, for which the editor of the BULLETIN apologizes, the article entitled "Multiplying $545" in the February BULLETIN wrongly gave credit to an Illinois city. The splendid experiment discussed in this article should be credited to Peru, Indiana.

Red Cross Seal Plans for 1916

Red Cross Seal agents who are just now trying to recuperate after the strenuous days of the 1915 campaign may find some comfort in the realization of the fact that work is already well under way for the sale next fall. Reports to date indicate a sale for 1915 approximating 80,000,000 seals, but long before the total figures can be secured the presses will be grinding out the supply of 300,000,000 seals for 1916 at the rate of two or three millions a day.

At a conference of Red Cross Seal agents held in Washington on February 18 a number of questions relating to the 1916 campaign were discussed and settled.

It was agreed by all those present and by the American Red Cross and the National Association that a better quality of seal be secured this year both in character of design, workmanship, paper, adhesive qualities, and color. It was felt that a radical departure should be made from the designs of previous years, but that the Santa Claus motif should still be retained. Before this BULLETIN is issued the design will have been accepted, and by April 1 contracts for printing will probably be let.

In a thorough discussion of the mail-sale method of selling seals it was generally agreed that the restrictions laid down last year by the American Red Cross be continued in force. While there was considerable difference of opinion on such questions as a first-class mail outgoing letter and a stamped return-envelope, the general concensus of opinion was that these restrictions were distinctly in the nature of conserving the good and eliminating the bad features of the mail-sale method. The rules adopted will become a part of all general agents' contracts.

One radical departure from previous methods of distributing seals was approved. Instead of furnishing free to general agents an unlimited supply of seals, as heretofore, the American Red Cross will supply free of charge seals only up to an amount equal to four times the number that will be actually sold in 1916. Above that amount agents will be required to pay cost price for the seals.

It was also agreed that a definite date be fixed, before which seals must not be placed on sale, and November 15 was settled upon as the desirable date.

While the exact nature of advertising matter to be furnished was not decided, it was agreed that the Red Cross should furnish blotters, similar to those used in 1913, in addition to the usual envelope enclosures.

Spring Conferences for Tb. Workers

Besides the National Association meeting, there are two other spring conferences which should interest anti-tuberculosis workers, especially in the vicinities where the meetings will be held.

The National Conference of Charities and Correction will meet at Indianapolis, May 10–17. While tuberculosis will probably not be a subject for special discussion, those who can attend this conference will receive much benefit in participating in the discussions of the many other related subjects. This is a good opportunity to meet and listen to the men and women who have helped to make social work a profession and to take philanthropy out of the slough of alms-giving and give it a preventive instead of remedial aspect.

The Southern Sociological Congress which will meet at New Orleans, April 12–16, is of even more vital interest to anti-tuberculosis workers. The program of this congress will be devoted entirely to health. There will be a series of symposiums on the following topics: "The Government and Health," "The School and Health," "The Medical Profession and Health," "The Press and Health," "Race Relations and Health," and "The Church and Health." General discussions on various health problems will be held before the congress as a whole. Southern anti-tuberculosis workers will do well to attend this important meeting.

Programs and other information concerning the National Conference of Charities and Correction may be obtained from Mr. William T. Cross, secretary, 315 Plymouth Court, Chicago. Information on the Southern Sociological Congress may be obtained from Mr. J. E. McCulloch, secretary, Nashville, Tenn.

The National Association Meeting

The National Association's meeting at Washington, D. C., May 11–12 should interest every anti-tuberculosis worker. Special efforts are being made by the various section chairmen to build a program of much higher character than ever before.

In the Sociological Section, under the direction of Seymour H. Stone, chairman, the subjects to be discussed will be of vital significance, including such topics as "The Interstate Significance of the Tuberculosis Problem," "The Tuberculosis Dispensary's Place in the Campaign," and "Tuberculosis as an Industrial Problem," taking up health insurance and similar schemes.

The Clinical Section, under the direction of Dr. Thomas McRae, chairman, will have one session on "The X-Ray in Tuberculosis" and another on the "Problem of Medical Training in Tuberculosis."

The Pathological Section, under the direction of Dr. G. B. Webb, chairman, has already been assured of a number of papers of unusual merit.

The Advisory Council, under the direction of Dr. Livingston Farrand, chairman, will discuss "Housing in Its Relation to Tuberculosis."

Speakers of national prominence have been assured for all of these programs. The National Conference of Tuberculosis Secretaries will also have an interesting and helpful program. This is an unusual opportunity to hear discussions on important topics relating to tuberculosis. It is also a rare chance to meet workers who are doing things that will interest you. Are you going?

New Edition "Facts About Tuberculosis" Free To Members

"Facts About Tuberculosis," a forty-eight-page pamphlet by Miss Lillian Brandt, of the New York School of Philanthropy, has been completely revised and a new, corrected edition is now ready for distribution. Members of the National Association for the Study and Prevention of Tuberculosis are entitled to one copy each of this pamphlet and may secure it on application to the executive office. Those who received the first edition of the pamphlet are requested to destroy their copies and write for a free copy of the new edition, which will be supplied on request. Additional copies or copies to non-members of the association will be furnished through the *Journal of the Outdoor Life*, 289 Fourth Avenue, for twenty-five cents each, postpaid. In quantities of twenty-five or more the price will be reduced to fifteen cents. These prices are limited as to time.

The new edition of the pamphlet has been enlarged by the addition of eight pages, including additional tables and more descriptive text. It has been carefully edited by Dr. Louis I. Dublin, statistician of the Metropolitan Life Insurance Company. In its present form the pamphlet is without question one of the most valuable publications of this nature that have been issued in recent years. In forty-eight pages Miss Brandt has brought together all of the most vital social facts with reference to tuberculosis and has presented them in an interesting and graphic way. In reality the booklet is a series of more than twenty diagrams and charts, with a brief descriptive text explaining each.

Miss Brandt takes up such facts as the relative proportion of tuberculosis mortality, comparative death rates in American and foreign cities, sex and age as facts in the death rate, urban and rural mortality, racial and national factors in the death rate, occupational mortality, decrease in tuberculosis mortality, etc. Each fact is briefly stated in text and presented in diagram, the latest and most reliable figures being used. Miss Brandt's reputation as a statistician and social worker is so well established that workers in the anti-tuberculosis field may feel confident that the best possible data have been represented.

Medical Notes, Abstracts and Reviews

The object of this monthly department of the "Bulletin" is to put physicians in easy touch with medical and scientific literature, both American and foreign, including magazine articles, books, reports, etc., that bear directly or indirectly upon the treatment and prevention of tuberculosis. This is not a department for news and editorial comment. Its function is rather that of a catalogue or a librarian. Any material for this department of the "Bulletin" should be sent to Dr. George Mannheimer, 41 West 51st Street, New York, who has been chosen medical editor.

Readers of the "Bulletin" who wish to have copies of the publication sent to physicians working in dispensaries, sanatoria, laboratories, and in other forms of tuberculosis activities, who are not now receiving it, should send in such lists of names to the National Association. The "Bulletin" is sent free to those who are engaged in anti-tuberculosis work.

Complement Fixation in Pulmonary Tuberculosis.—It has been demonstrated that antibodies appear in the blood after injections of tuberculin, and Citron suggested that a similar process may take place in active tuberculosis, and that complement-binding bodies might be present in varying amounts. This has been found to be true; and since Besredka worked out a suitable antigen, much work has been done on fixation of complement in tuberculosis. A brief statement of the results obtained by Craig * may be of interest. Craig prepared his antigen as follows: Several strains of tubercle bacilli of the human variety were grown in alkaline broth to which was added 1 dram each of egg white and yolk per 250 c.c. After the growth was well advanced, an equal volume of 95 per cent. alcohol was added, the mixture shaken for twelve hours and incubated at 37 C. (98.6 F.) for twenty-four hours, and then shaken six hours and filtered through a fine filter. The filtrates of different strains were mixed and titrated for the anti-complementary, hemolytic, and antigenic properties. The antigen soon loses its properties unless kept in the cold. The human hemolytic system was used, the technic in general being the same as for the Wassermann test. The tubes were examined from one to two hours after the last incubation in order to avoid confusion on account of late laking occurring in tubes showing fixation of complement. Craig made observations in 166 cases of pulmonary tuberculosis, grouped into three classes, the incipient, the moderately advanced, and the far advanced, each class being then divided into active and inactive groups. The results show that of 25 incipient cases, 24 inactive gave a positive reaction in 58.3 per cent., the single active case giving a positive result; of 85 moderately advanced cases, 32 inactive were positive in 68.7 per cent. and 53 active in 96.2 per cent.; of 56 far-advanced cases, 3 inactive all gave positive results, and 53 active gave 96.2 per cent. positive results. Generally speaking, the strength of the reaction seemed to be in proportion to the amount of lung involved. For control purposes, 100 healthy persons and 150 patients suffering from diseases other than tuberculosis were examined, all giving negative results with the exception of two syphilitics, in whom careful subsequent examination revealed a coincident tuberculosis. In view of the uniformly negative results in healthy individuals and the positive results obtained in active tuberculosis, it appears that so long as the test continues positive in a given case, the patient cannot be considered cured, although all clinical signs have disappeared. A test which gives a positive reaction in 60 per cent. of cases of incipient tuberculosis should prove to be a valuable aid in making early diagnosis.—*Jour. A. M. A., editorial, Jan. 22, 1916.*

* *Amer. Jour. Med. Sciences, Dec., 1916.*

The Blood in Tuberculosis.—The blood of 84 cases of Tb. was inoculated into guinea-pigs. Three proved positive. Two of them were actively progressive cases of advanced disease, one was moderately advanced, not progressive and had not reacted to large doses of tuberculin. Sixty-three of the 84 had not received tuberculin and two of that group gave a positive blood finding. The remaining 21 had received one mg. or more of tuberculin and one of this group had a positive blood finding. Tubercle bacilli are not often found in the blood of tuberculous patients even in open and active cases. Tb. bacilli introduced into the blood are easily demonstrable. Tuberculin even in large doses does apparently not cause the appearance of Tb. bacilli in the circulating blood.—*Ueber das Vorkommen von Tuberkelbacillen im Blute von Patienten mit Lungentuberkulose, Lawrason Brown, Heise & Petroff, Zeitschr. fuer. Tb., 1915, Band 24, Heft 2 (transl. from Int. Centralblatt fuer Tb. Forschung).*

Tubercle Bacilli in the Blood.—A number of different methods have been employed to determine whether tubercle bacilli are present in the circulation of patients with advanced pulmonary Tb. (1) Blood withdrawn from 38 patients was inoculated intraperitoneally into guinea-pigs. Autopsies and microscopic sections two and three months later failed to reveal any evidence of Tb. (2) Microscopic examination of the blood withdrawn from the patients yielded negative results. The many sources of error in the microscopic examination of blood for tubercle bacilli have been pointed out. (3) The blood of 7 patients previously subjected to a tuberculin injection was inoculated intraperitoneally into guinea-pigs. Autopsies and microscopic sections failed to reveal any evidence of Tb. (4) In 3 patients who had previously received a tuberculin injection blood was withdrawn and after removal of the serum was inoculated intraperitoneally into guinea-pigs. One of the pigs developed an extensive Tb. (5) An attempt made to grow the tubercle bacilli directly from the blood proved unsuccessful.

The negative results yielded by these 47 cases do not prove conclusively that tubercle bacilli are never present in the circulation, but they strongly suggest that a bacillemia such as is present in other infectious diseases is at least uncommon in pulmonary Tb., even in advanced stages of the disease. It may be that from time to time tubercle bacilli are washed into the circulation from a pulmonary focus, and that they rapidly disappear from the blood. That such a rapid departure from the blood does occur, has been demonstrated in the case of rabbits in whom tubercle bacilli could no longer be recovered from the blood thirty minutes after their intravenous inoculation. (Heynman &

Otto.) When the blood of 10 patients previously subjected to a tuberculin injection was inoculated into guinea-pigs, one of the animals presented a generalized Tb. at autopsy. It would be unwise to draw conclusions from one positive result, but the nine negative results coincide with our daily clinical experience, for if a therapeutic tuberculin reaction could cause virulent tubercle bacilli to appear in the circulation the development of acute miliary Tb. would be a common occurrence. Nevertheless, the question of a possible mobilization of tubercle bacilli following diagnostic and therapeutic tuberculin inoculations deserves careful investigation.—*Concerning the presence of tubercle bacilli in the blood of tuberculous patients, L. Kessel, Am. Jour. of the Med. Sciences, Sept., 1915.*

Principal Causes of Death.—More than 30 per cent. of the 898,059 deaths reported for 1914 in the "registration area," which contained about two-thirds of the population of the entire United States, were due to three causes—heart diseases, tuberculosis, and pneumonia, and more than 60 per cent. to eleven causes—the three just named, together with Bright's disease and nephritis, cancer, diarrhea and enteritis, apoplexy, arterial diseases, diphtheria, diabetes, and typhoid fever. These are figures taken from mortality statistics in the United States for 1914.

The deaths from heart diseases (organic diseases of the heart and endocarditis) in the registration area in 1914 numbered 99,534, or 150.8 per 100,000 population. The death or mortality rate from this cause shows a marked increase as compared with 1900, when it was only 123.1 per 100,000.

Tuberculosis in its various forms claimed 96,903 victims in 1914, of which number 84,366 died from tuberculosis of the lungs (including acute miliary tuberculosis). As a result of a more general understanding of the laws of health, the importance of fresh air, etc., due in part, no doubt, to the efforts of the various societies for the prevention of tuberculosis, there has been a most marked and gratifying decrease during recent years in the mortality from this scourge of civilization. In only a decade —from 1904 to 1914—the death rate from tuberculosis in all its forms fell from 200.7 to 146.8 per 100,000, the decline being continuous from year to year. This is a drop of more than 25 per cent. Prior to 1904 the rate had fluctuated, starting at 201.9 in 1900. Even yet, however, tuberculosis has the gruesome distinction of causing more deaths annually than any other form of bodily illness except heart diseases, and over 40 per cent. more than all external causes—accidents, homicides, and suicides combined.

Pneumonia (including bronchopneumonia) was responsible for 83,804 deaths in the registration area in 1914, or 127 per 100,000—the lowest rate on record. The mortality rate from this disease, like that from tuberculosis, has shown a marked decline since 1900, when it was 180.5 per 100,000. Its fluctuations from year to year, however, have been pronounced, whereas the decline in the rate for tuberculosis has been nearly continuous.—*Extract from press summary issued by the U. S. Bureau of the Census, Jan. 17, 1916.*

Artificial Pneumothorax Results.—Experience with artificial pneumothorax in the treatment of pulmonary Tb. is gradually modifying the sphere of its application. The trend is toward its use, regardless of stage, in all progressive cases (particularly with unilateral involvement) which fail, after sufficient trial, to respond to strict sanatorium regimen.

Complications incident to the employment of this method, the great importance of continuous strict observation and thorough clinical, laboratory, and Roentgen study of each individual case, the rest periods essential after each reinflation, the inability of outlining in advance the time of reinflations, in short, the close dependence of each successive step in pneumothorax therapy on the varying condition of the patient are all factors which call, in the majority of cases, in the interest of safety and best results, for hospital or sanatorium supervision, at least for a few months, of each individual case in which the method is being applied. Close attention to every important detail of technic, as well as strict asepsis, is also less of a problem, under such conditions, regardless of the excellent results obtained by some observers, in dispensary and office practice.

The present tendency, grown out of experience, is toward greater conservatism in the selection of cases, a selection based on thorough preliminary study and full consideration of the possible effect of compression in the individual case. Conservatism needs to characterize each successive step in the gradual attainment and subsequent maintenance of a satisfactory compression, with avoidance of too frequent reinflations and excessive intrapleural pressure. This attitude is very important, with a method the application of which cannot be subject to rule, but is dependent on the condition of each individual case.

Through improvement of various details of technic and greater conservatism of action pneumothorax therapy is gradually finding its defined place in the treatment of cases of pulmonary Tb. which do not yield to other methods.—*Artificial pneumothorax in the treatment of pulmonary tuberculosis. Results obtained by 24 American observers, T. B. Sachs, Jour. of A. M. A., Nov. 27, 1915.*

Apical Predisposition. — The pulmonary apices are firmly grasped by the ossifying first costal cartilages (Freund); their ventilation and circulation is interfered with and a fertile soil for the implantation of the tubercle bacillus has thus been created. Apical Tb. rarely occurs in children because their apices are situated within or underneath the upper thoracic aperture, whereas the apices of the adolescent grow up through the aperture and are being damaged by its anomalies. Senile phthisis runs a more favorable course because the degenerated cartilages give way under the traction of the muscles and thereby permit of a better ventilation and circulation of the apices. Apical Tb. does not occur in animals because all parts of the lung respire uniformly.—*Hart: Betrachtungen ueber die Entstehung der tuberkuloesen Lungenspitzenphthise. Zeitschr. fuer Tb., 1915, Band 24, Heft 2 (transl. from Int. Centralblatt fuer Tb. Forschung).*

Epidemiology of Tuberculosis.—That the tubercle bacillus was originally saprophytic is very probable. The great antiquity of the disease is shown by the relationship of the bacillus to its host, its adaptability, and its perfect, though antagonistic, symbiosis. Its varieties (avian, piscian, bovine, and human), its possible latency, low virulence, and habit of compromising with its host and its resistance to decomposition are mentioned. The lack of antitoxic immunity of any host of the tubercle bacillus is significant. The early ideas of epidemiology of tuberculosis were erroneous and various influences of climate and topography were claimed as the cause of the freedom of certain parts of the world before they became infected. Immune zones are still talked about, but they are usually uninfected territory, in which the absence of favoring conditions may have an inhibitory influence. The distinction between tuberculosis infection and tuberculous disease must be kept in mind. Smith holds that the closer the contact and more constant the infection the greater the danger, but only the careless consumptive needs to be dreaded. It is commonly understood that the infection usually occurs either by inhalation or ingestion, but the relative importance of these is not yet determined. It is generally conceded that a smaller dose will infect by inhalation than by ingestion, but this has not been scientifically proved. It is no longer doubted, however, that tubercle bacilli can pass through the intact mucous membrane of the intestinal canal and produce disease of the lungs or other distant parts without causing abdominal tuberculosis. The lymph glands are often, perhaps always, the first involved, and these glands are organs of defense. The bacilli, however, may be also distributed throughout the body by a true bacillemia and a few bacilli may be harbored for years in a lymph gland and finally escape and produce disease, hence the importance of latent infection and need of constant maintenance of vigorous physical resistance. The majority of all persons are infected before the age of twelve, and there is a growing conviction that such infection is the cause of later tuberculosis. Baldwin and others believe that adults are comparatively little endangered by exposure to tuberculosis infection because they are vaccinated against tuberculosis by accidental inoculation in early life and without this some hold adults would be as susceptible to first infection as the adults of other animals are known to be. Such immunity, however, in humans is attained at too great a cost, as about 10 per cent. of the deaths of children under fifteen are due to tuberculosis. There is some reason to believe that resistance is not developed under a certain age and the suggestion has been made that infants and young children should be given absolute protection by removal from tuberculous environment under a certain age. About 8 per cent. of deaths in tuberculosis in man are caused by bovine bacilli, mostly in children. The question of the use of milk and meat from tuberculous animals, while it has been exaggerated, is still a distinct menace.—*The Epidemiology of Tuberculosis, F. C. Smith, Jour. A. M. A., Jan. 8, 1916.*